FIG. 1

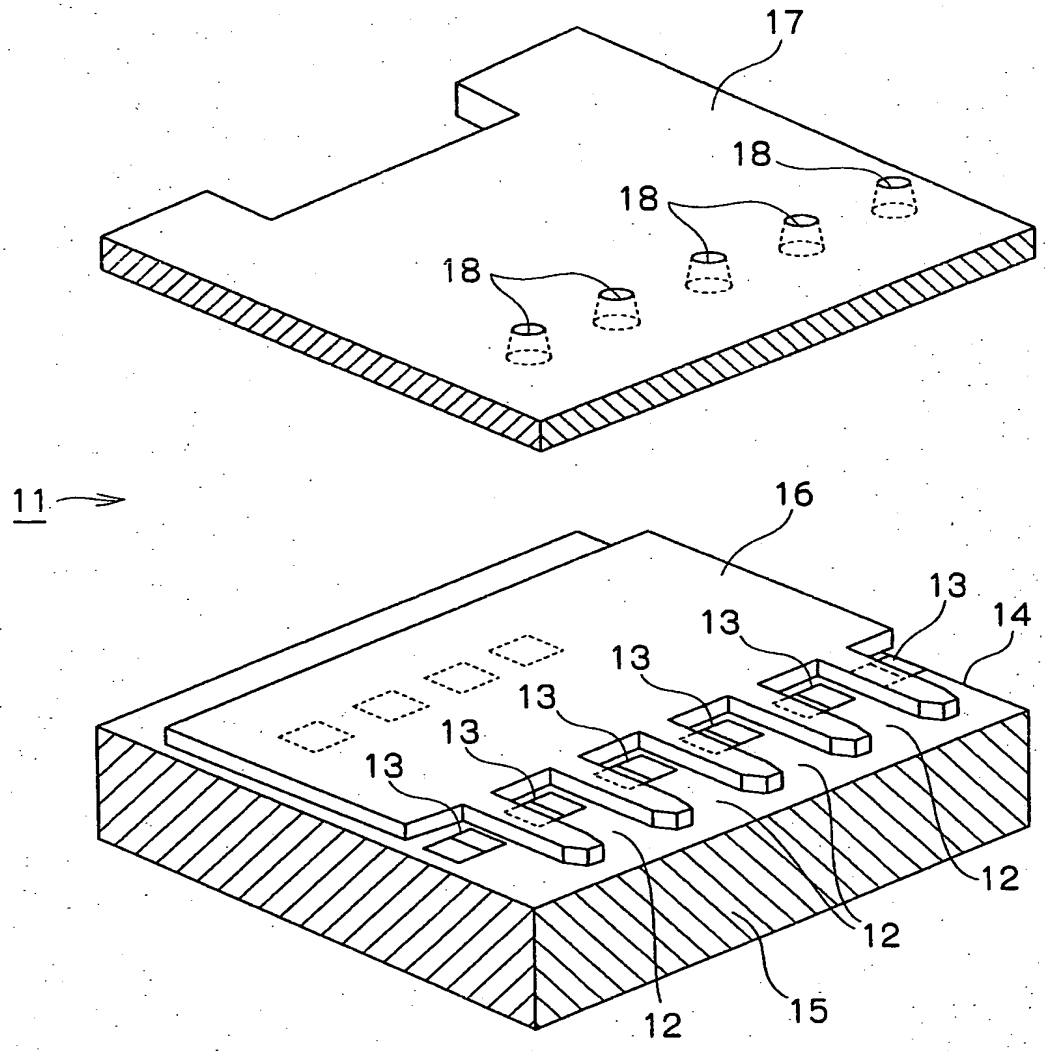

FIG. 2

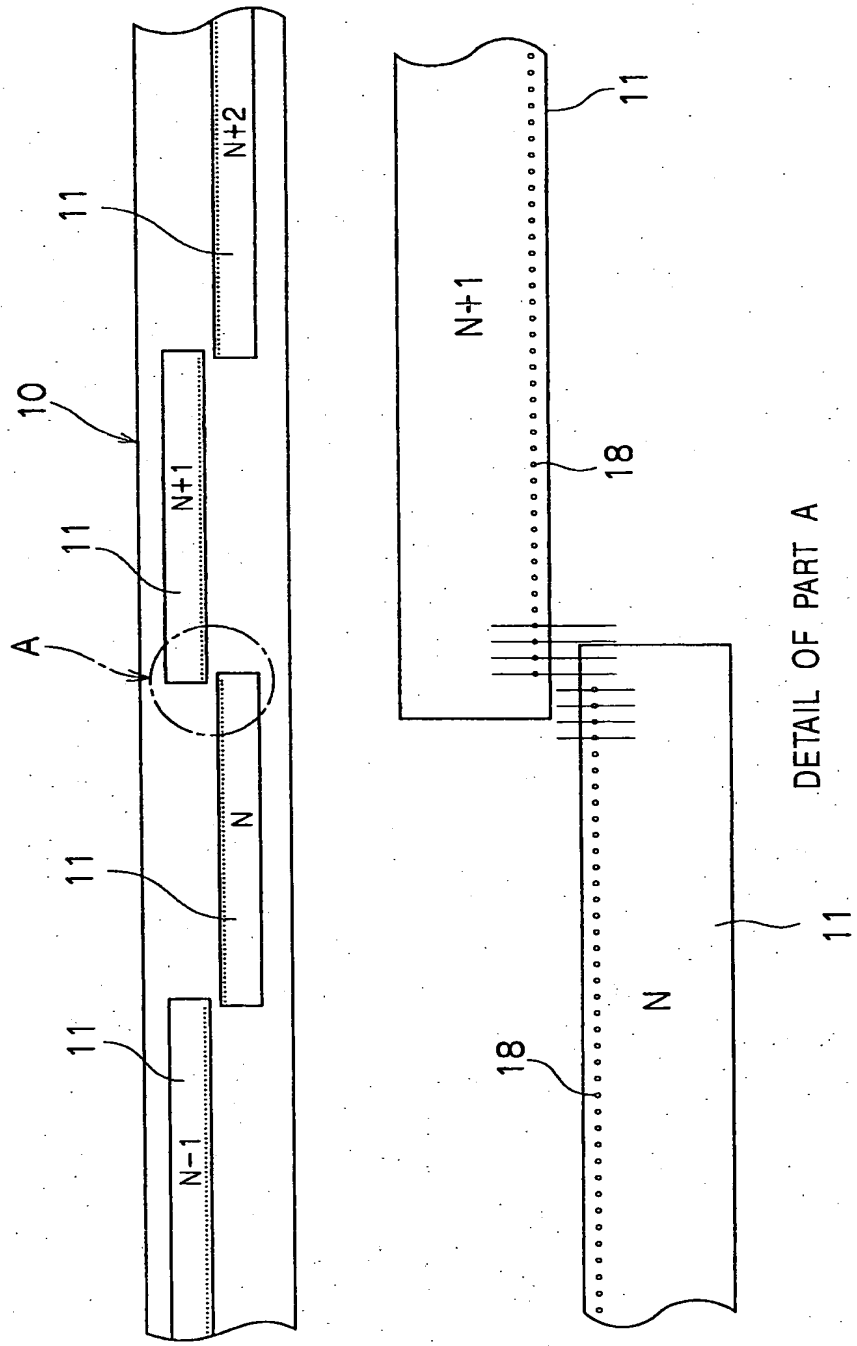

FIG. 3A

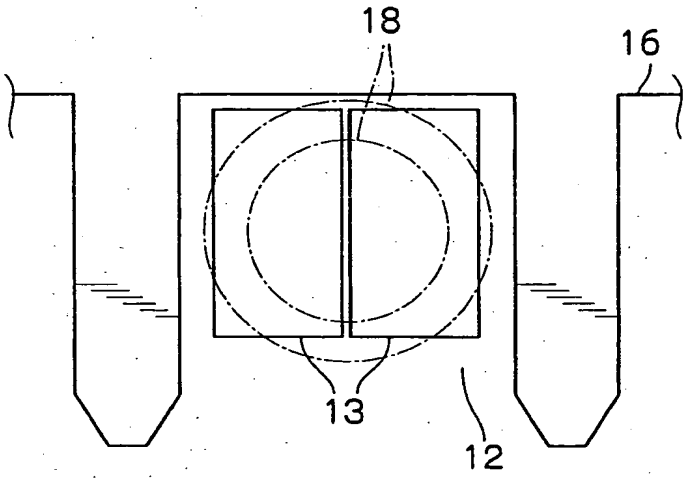

FIG. 3B

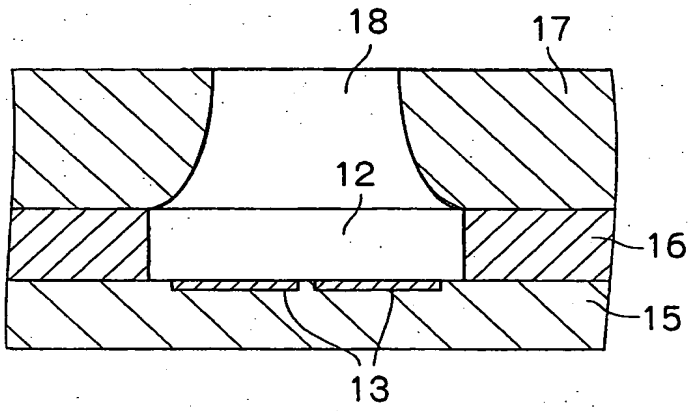

FIG. 4A

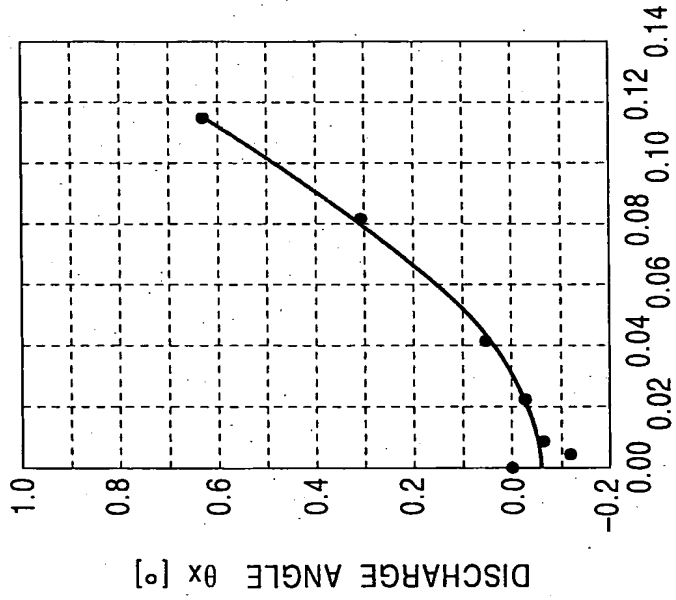
DISCHARGE ANGLE θx [°]
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
TIME LAG IN BUBBLE GENERATION [μsec]

FIG. 4B

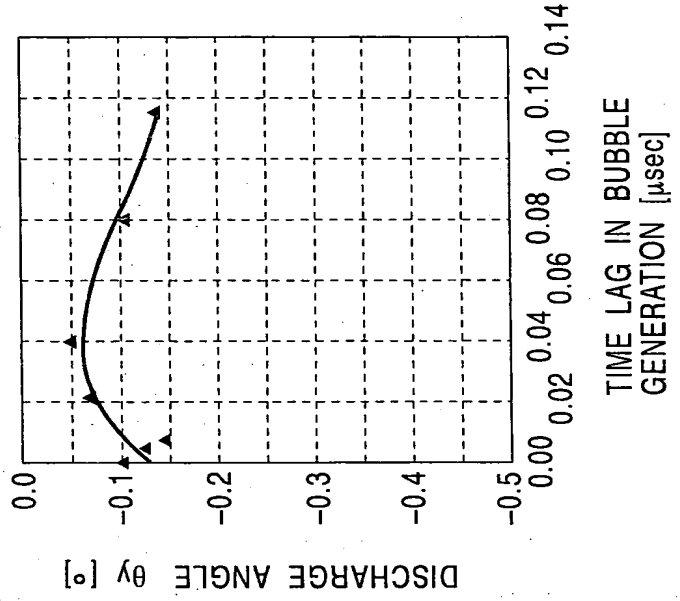
DISCHARGE ANGLE θy [°]
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
TIME LAG IN BUBBLE GENERATION [μsec]

FIG. 4C

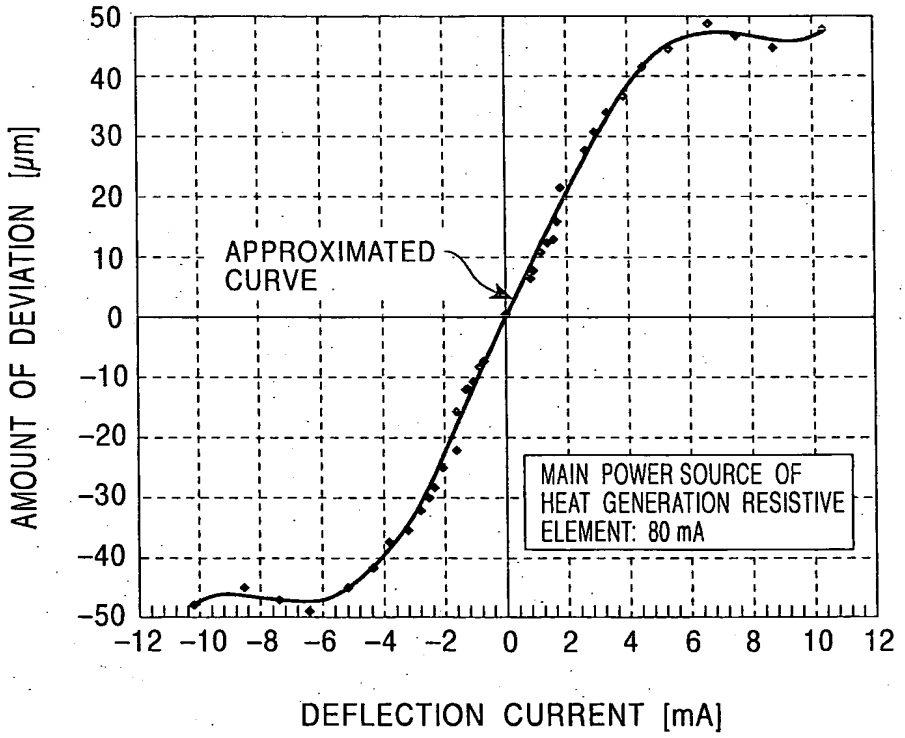
50
40
30
20
10
0
−10
−20
−30
−40
−50
−12 −10 −8 −6 −4 −2 0 2 4 6 8 10 12
AMOUNT OF DEVIATION [μm]
DEFLECTION CURRENT [mA]
APPROXIMATED CURVE
MAIN POWER SOURCE OF HEAT GENERATION RESISTIVE ELEMENT: 80 mA

FIG. 5

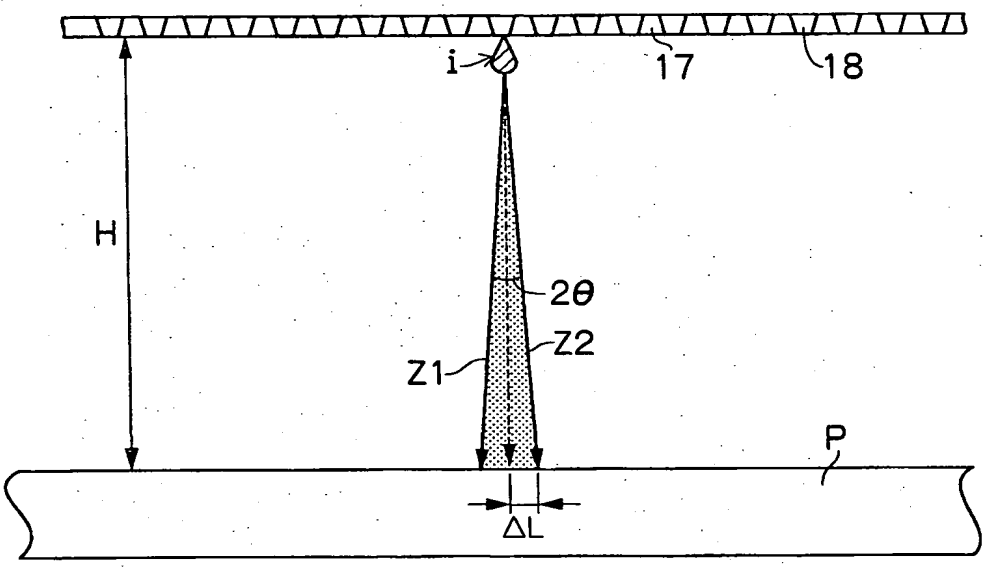

FIG. 6

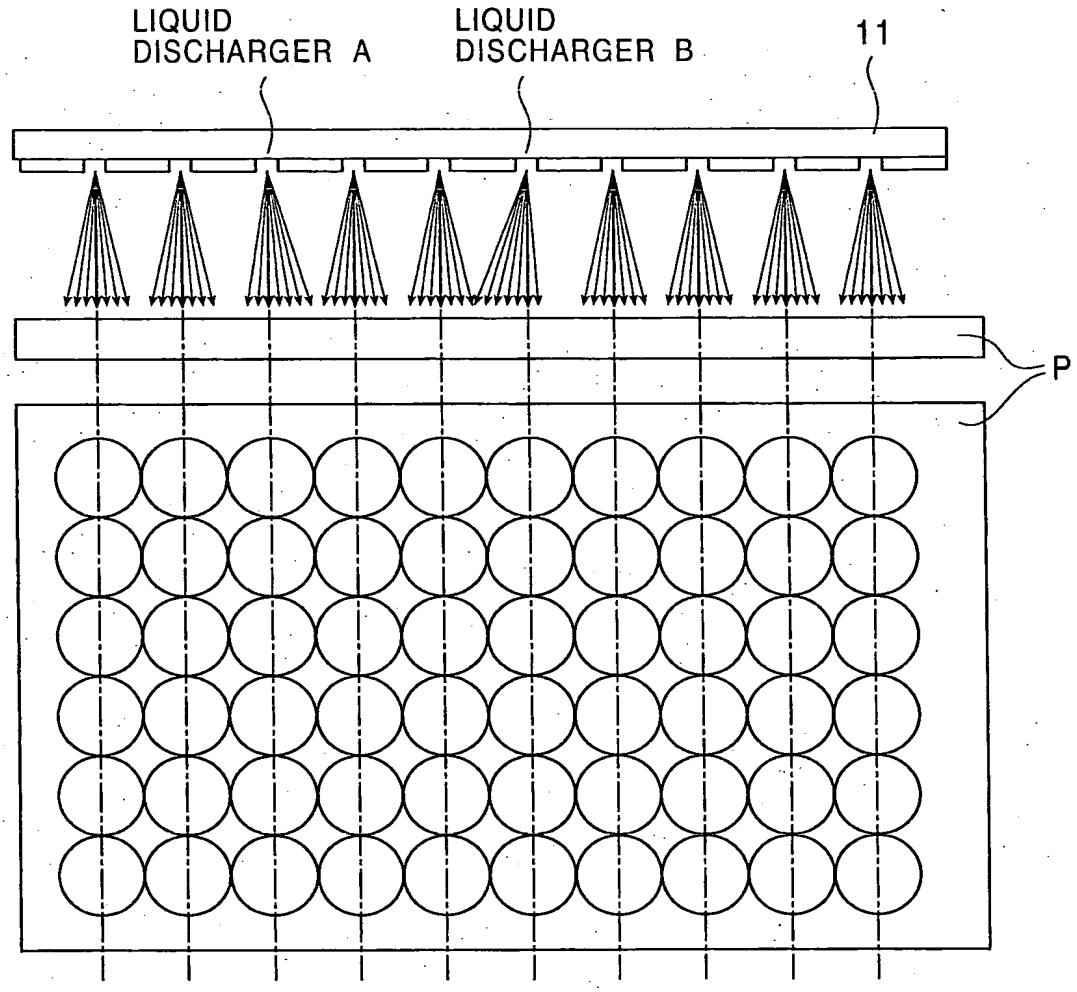

FIG. 7

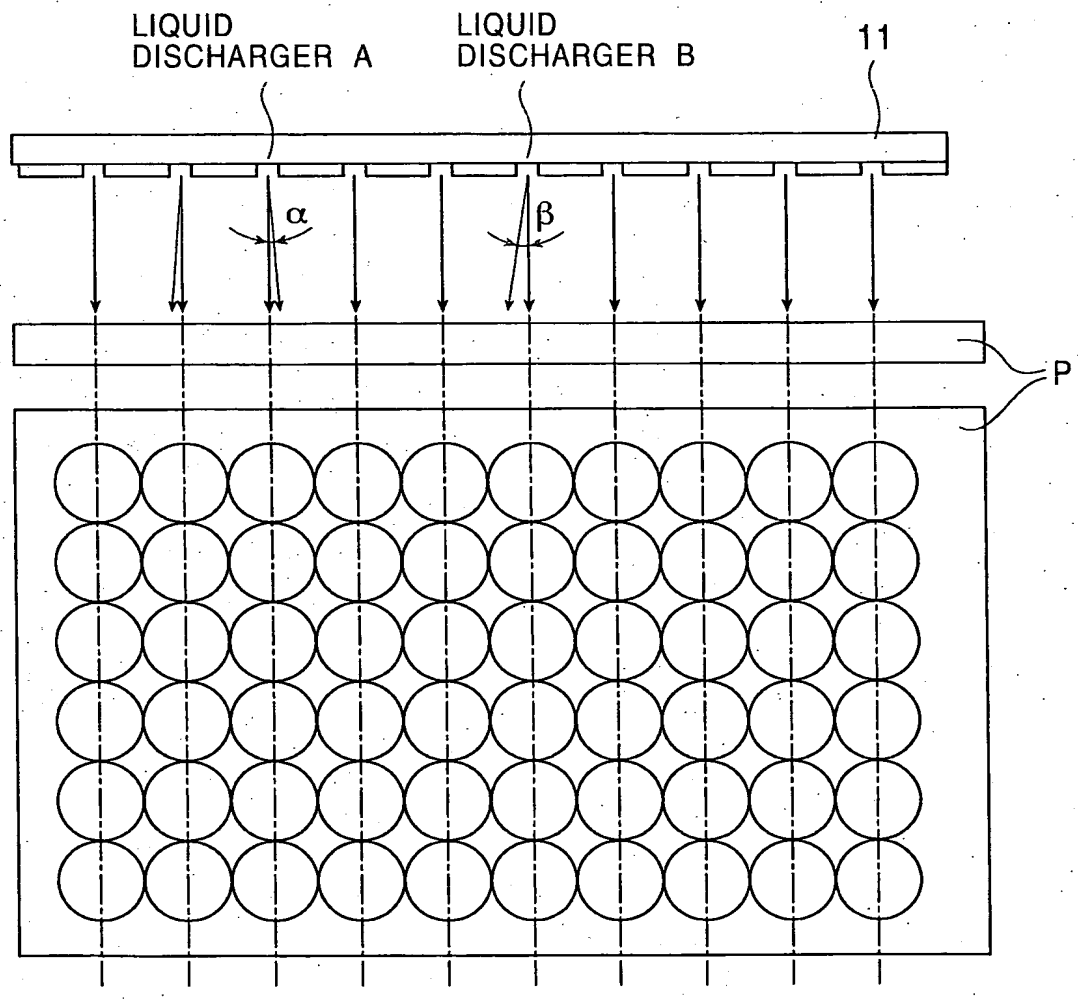

FIG. 8A

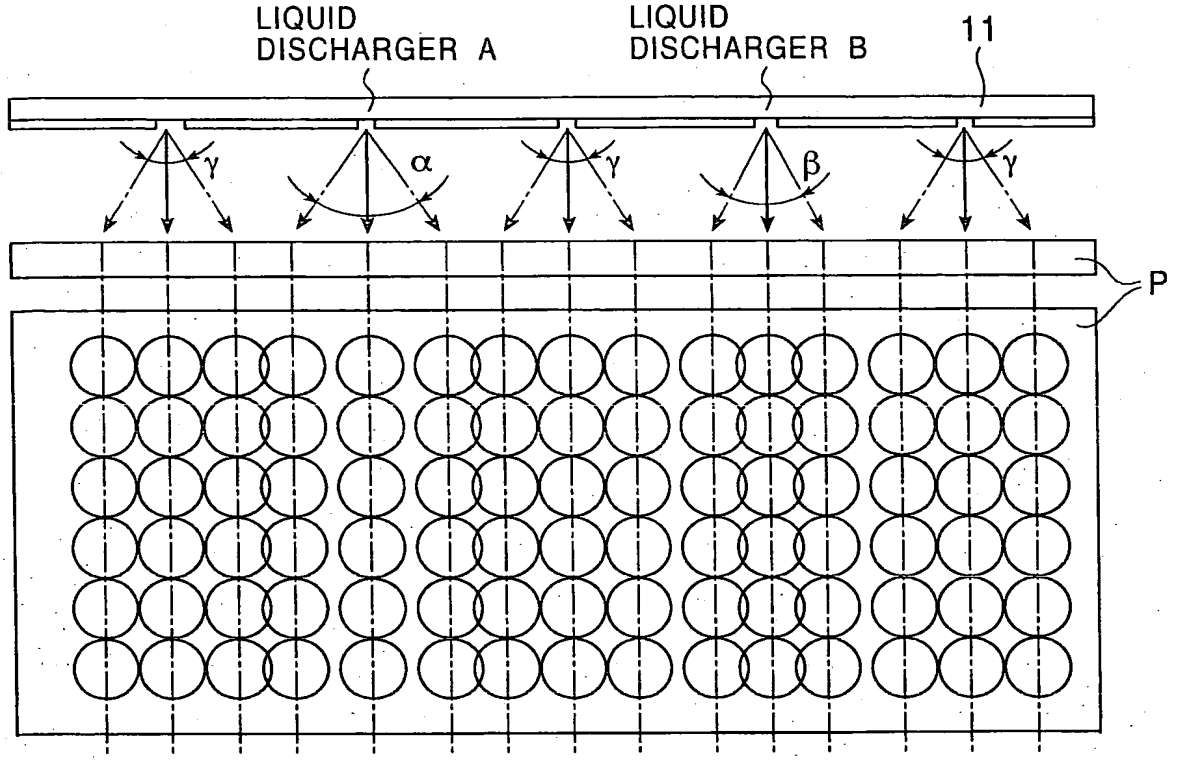
LIQUID
DISCHARGER A
LIQUID
DISCHARGER B
11
γ
α
γ
β
γ
P

FIG. 8B

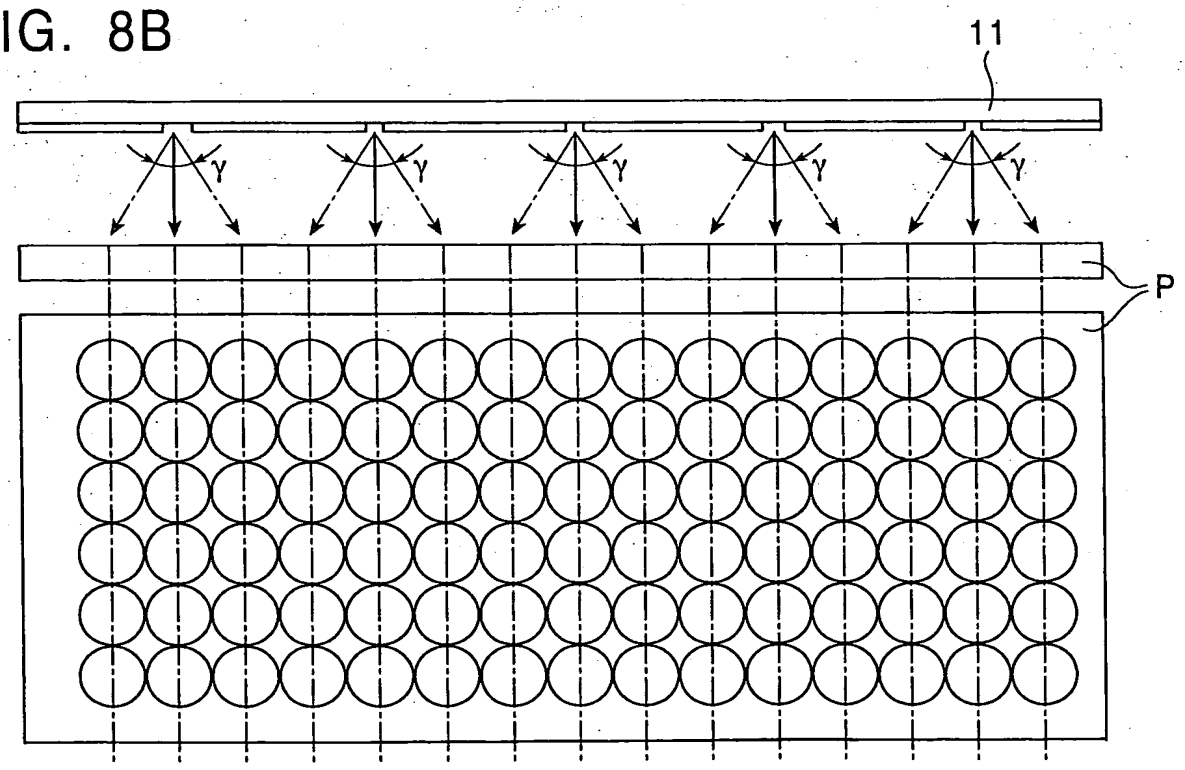
11
γ
γ
γ
γ
γ
P

FIG. 9

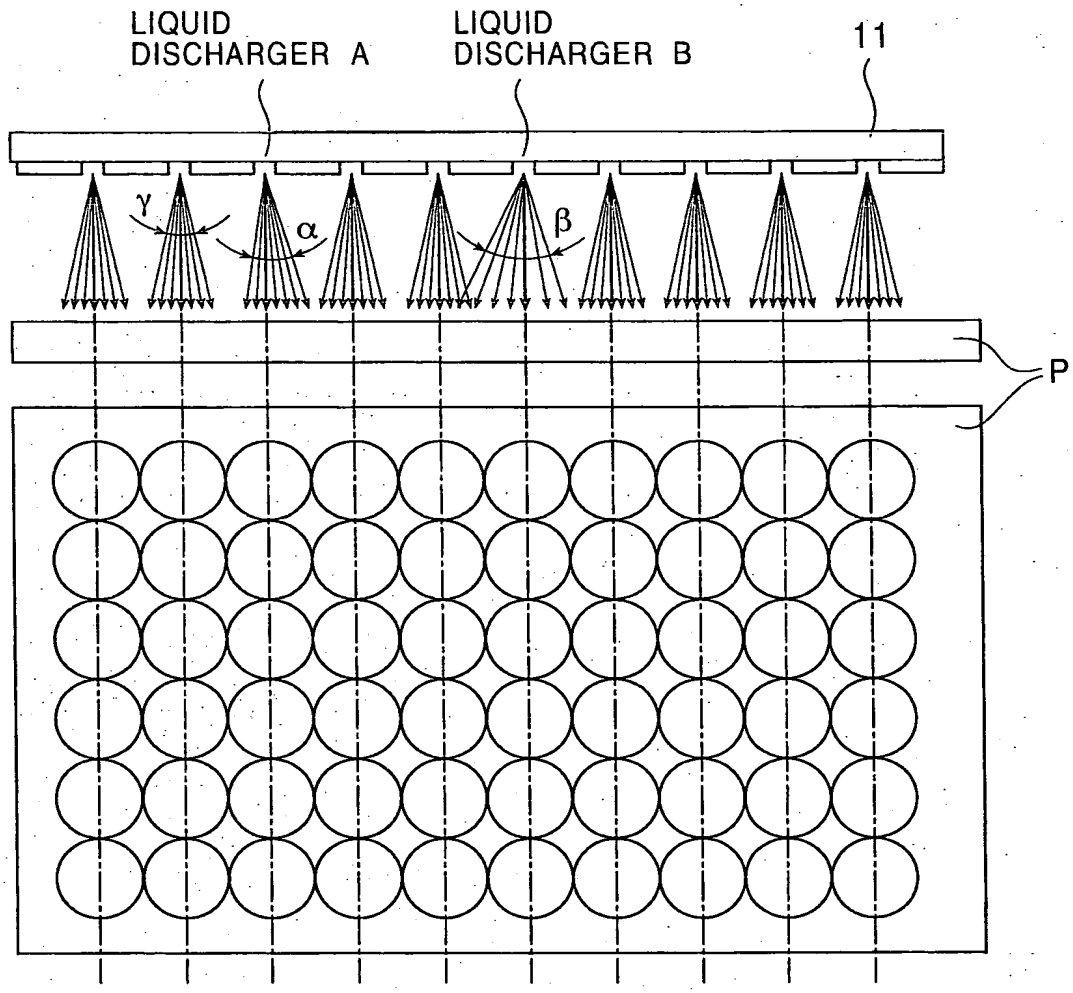

FIG. 10

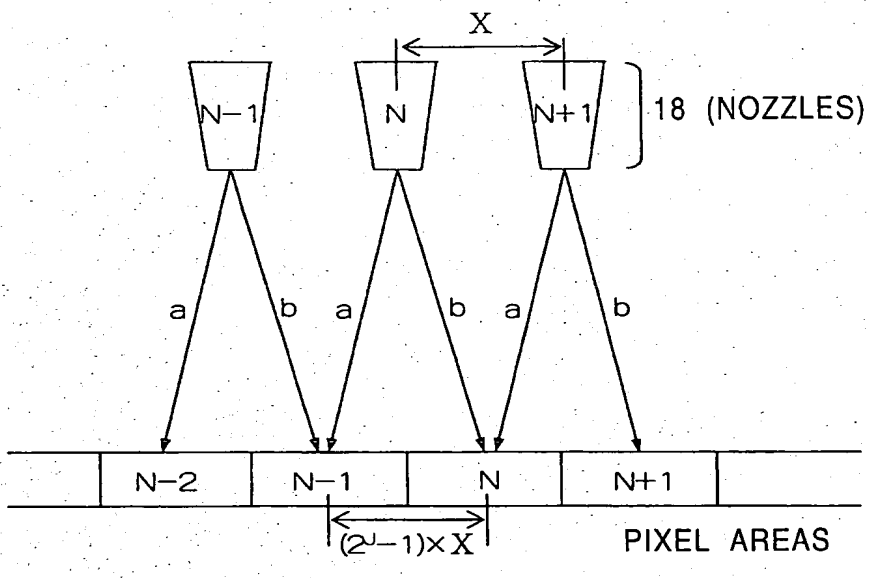

FIG. 11

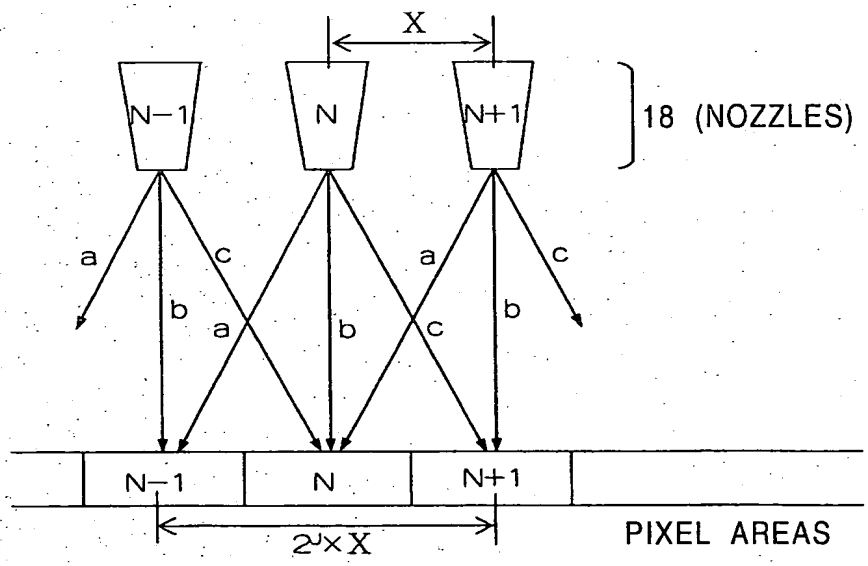

FIG. 12

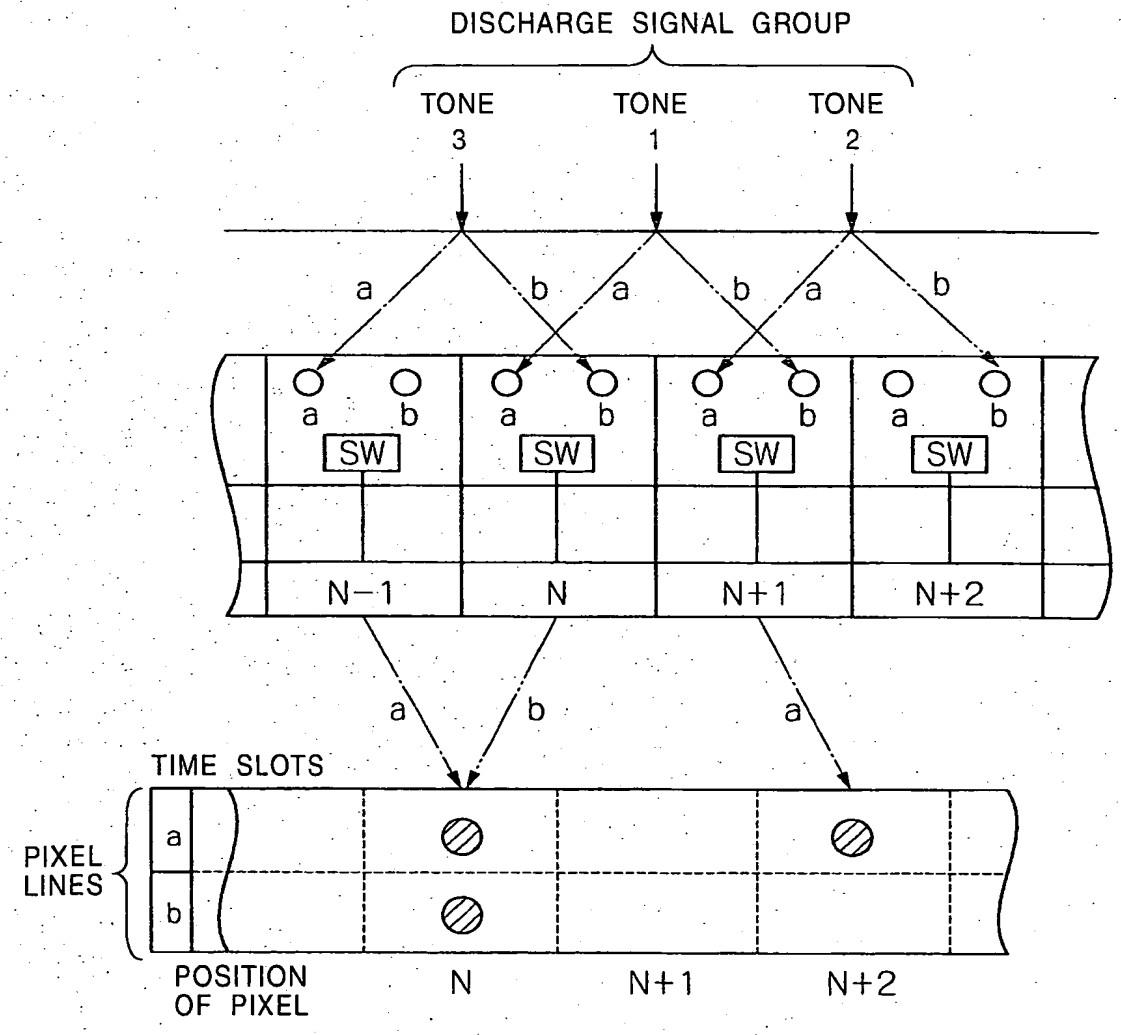
DISCHARGE SIGNAL GROUP
TONE 3
TONE 1
TONE 2
a
b
SW
N−1
N
N+1
N+2
TIME SLOTS
PIXEL LINES
POSITION OF PIXEL

FIG. 13

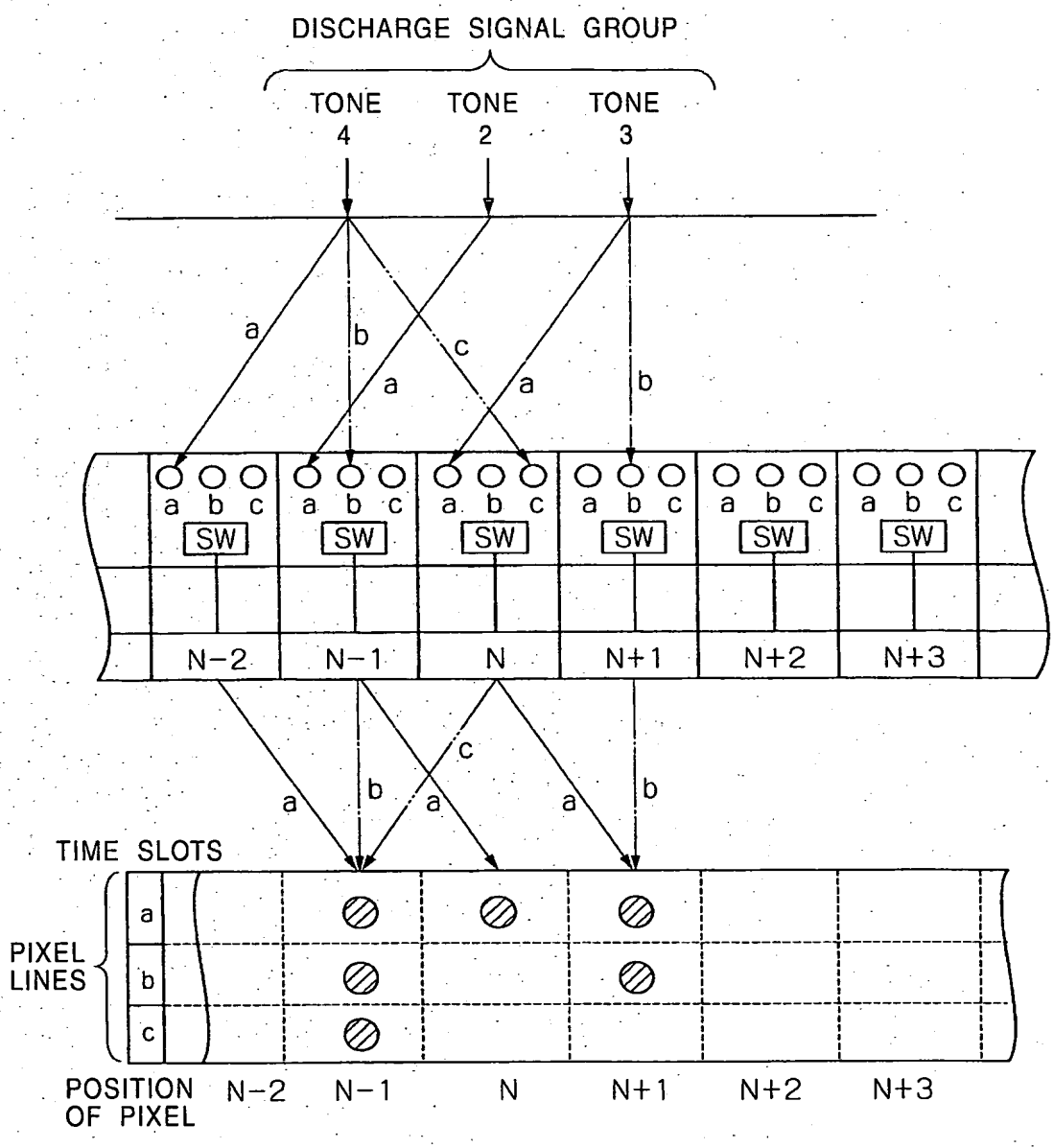
DISCHARGE SIGNAL GROUP
TONE 4
TONE 2
TONE 3
a
b
c
a
a
b
a b c
SW
N-2
N-1
N
N+1
N+2
N+3
TIME SLOTS
PIXEL LINES
a
b
c
POSITION OF PIXEL

FIG. 14

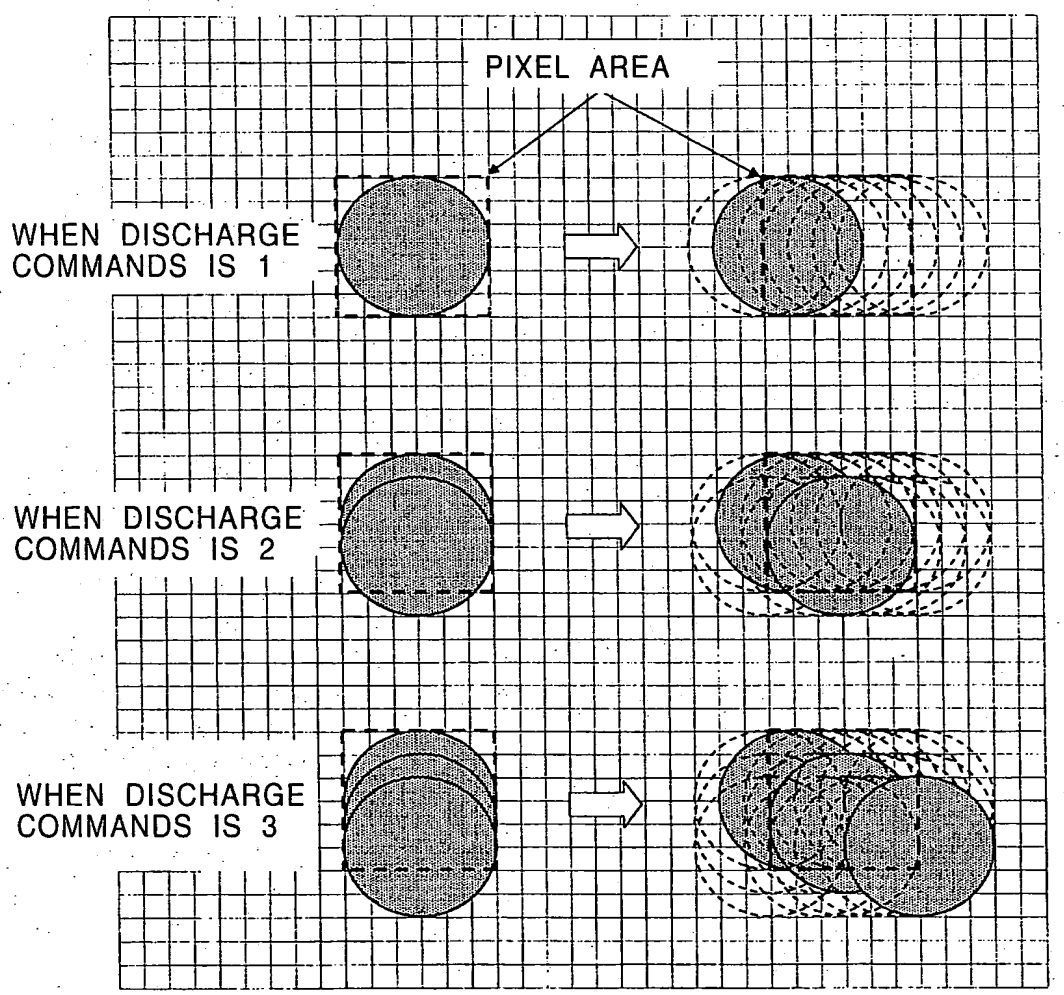
PIXEL AREA
WHEN DISCHARGE COMMANDS IS 1
WHEN DISCHARGE COMMANDS IS 2
WHEN DISCHARGE COMMANDS IS 3

FIG. 15

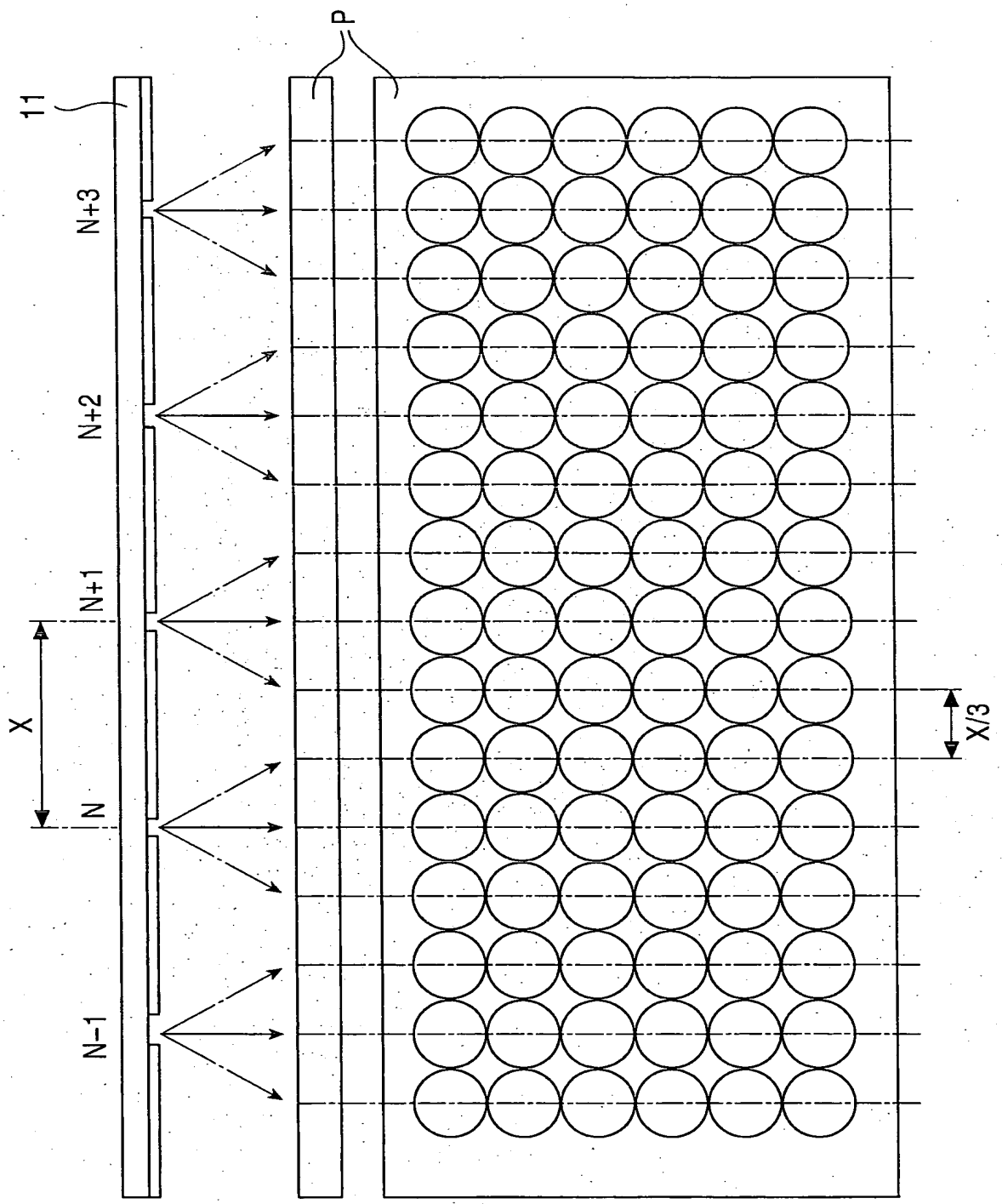

FIG. 16

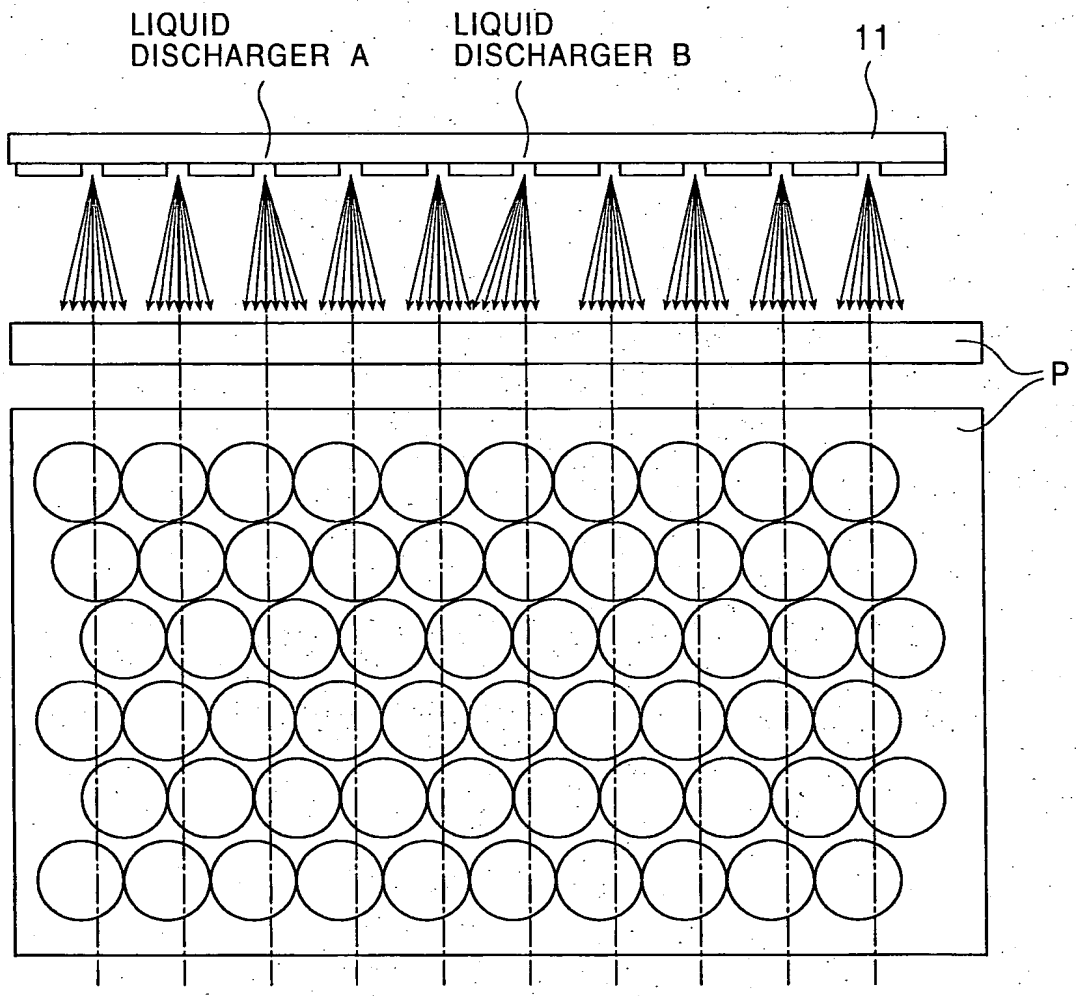

FIG. 17

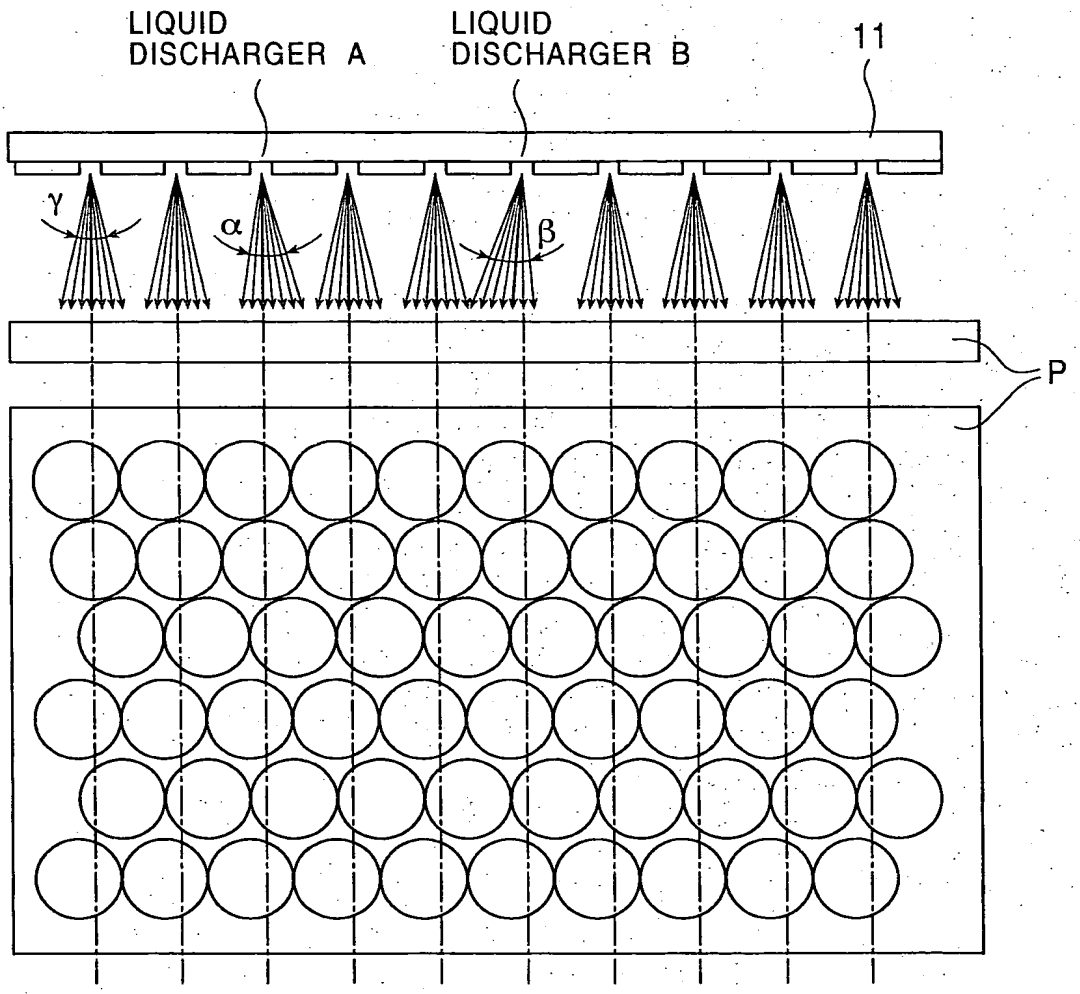

FIG. 18

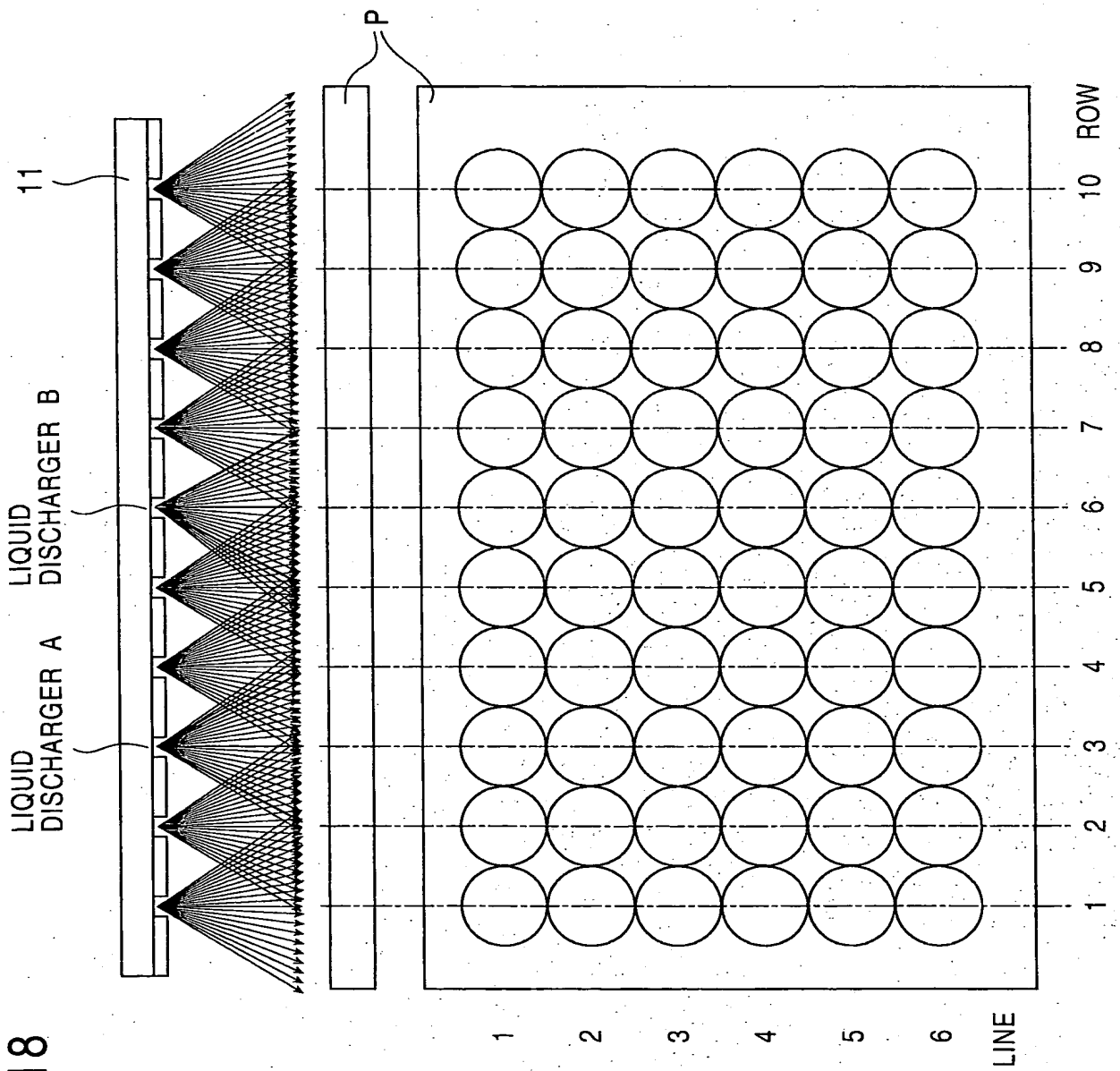
LIQUID DISCHARGER A
LIQUID DISCHARGER B
11
P
ROW
1
2
3
4
5
6
7
8
9
10
LINE
1
2
3
4
5
6

FIG. 19

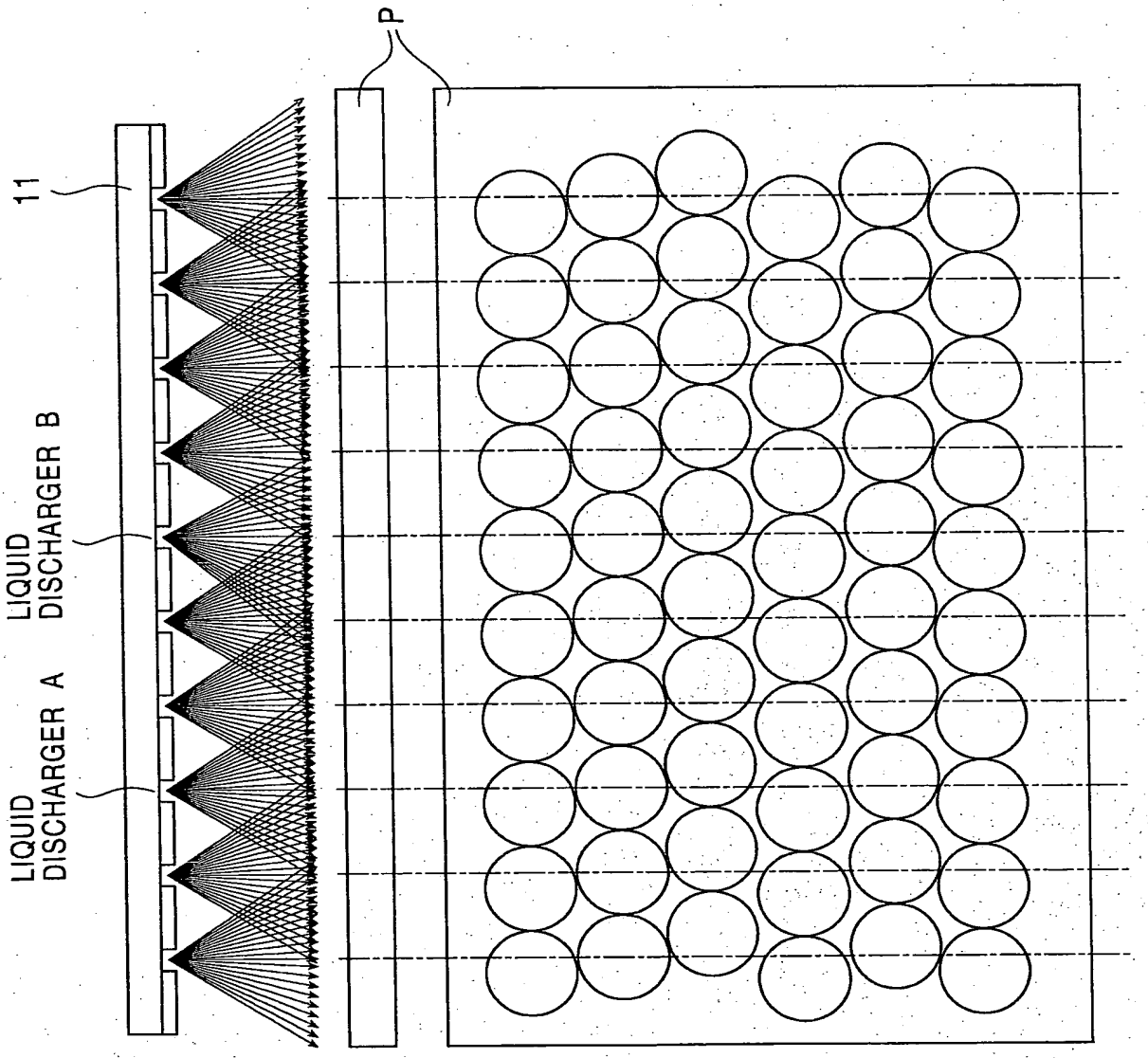

FIG. 20

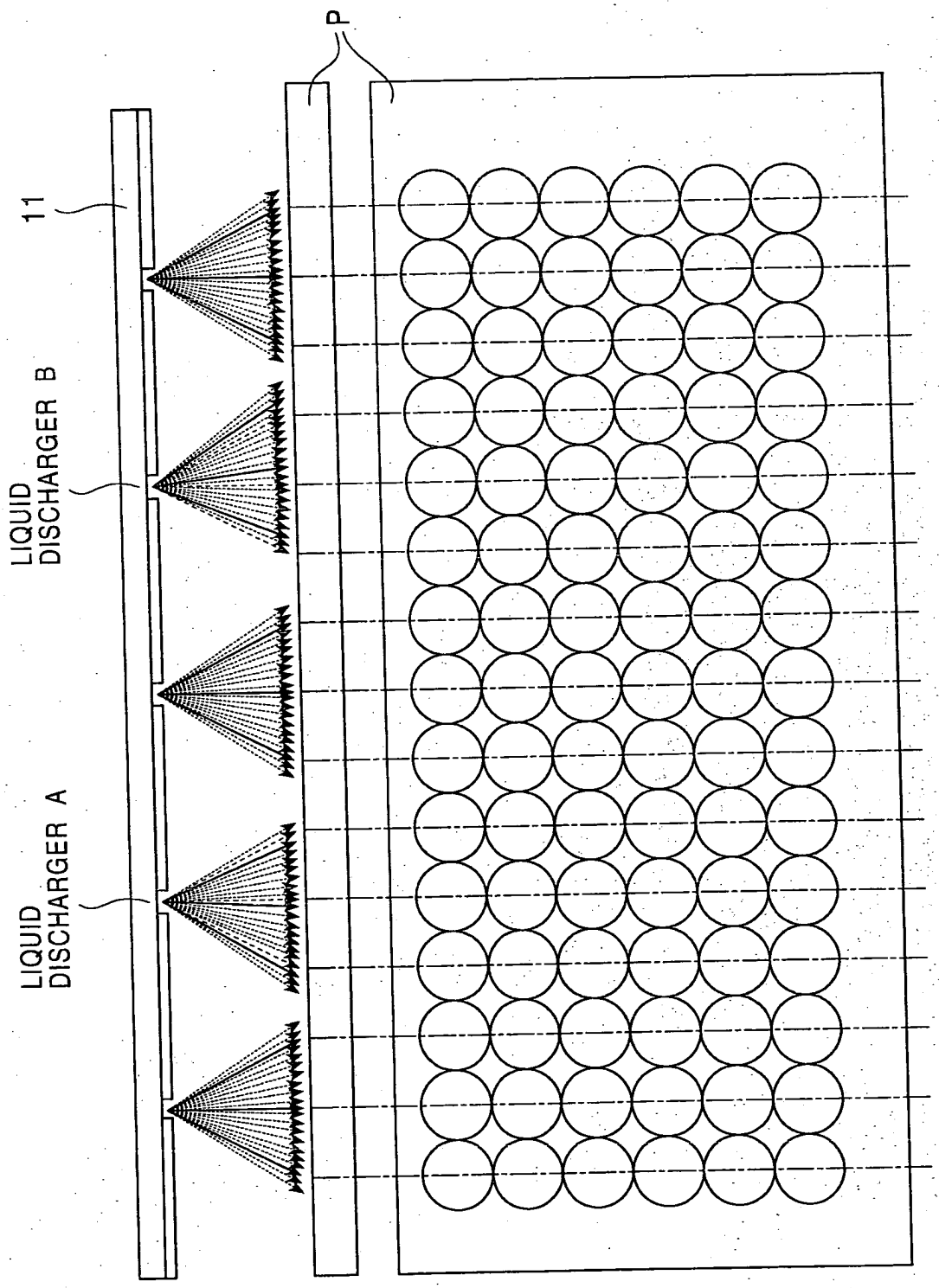

FIG. 21

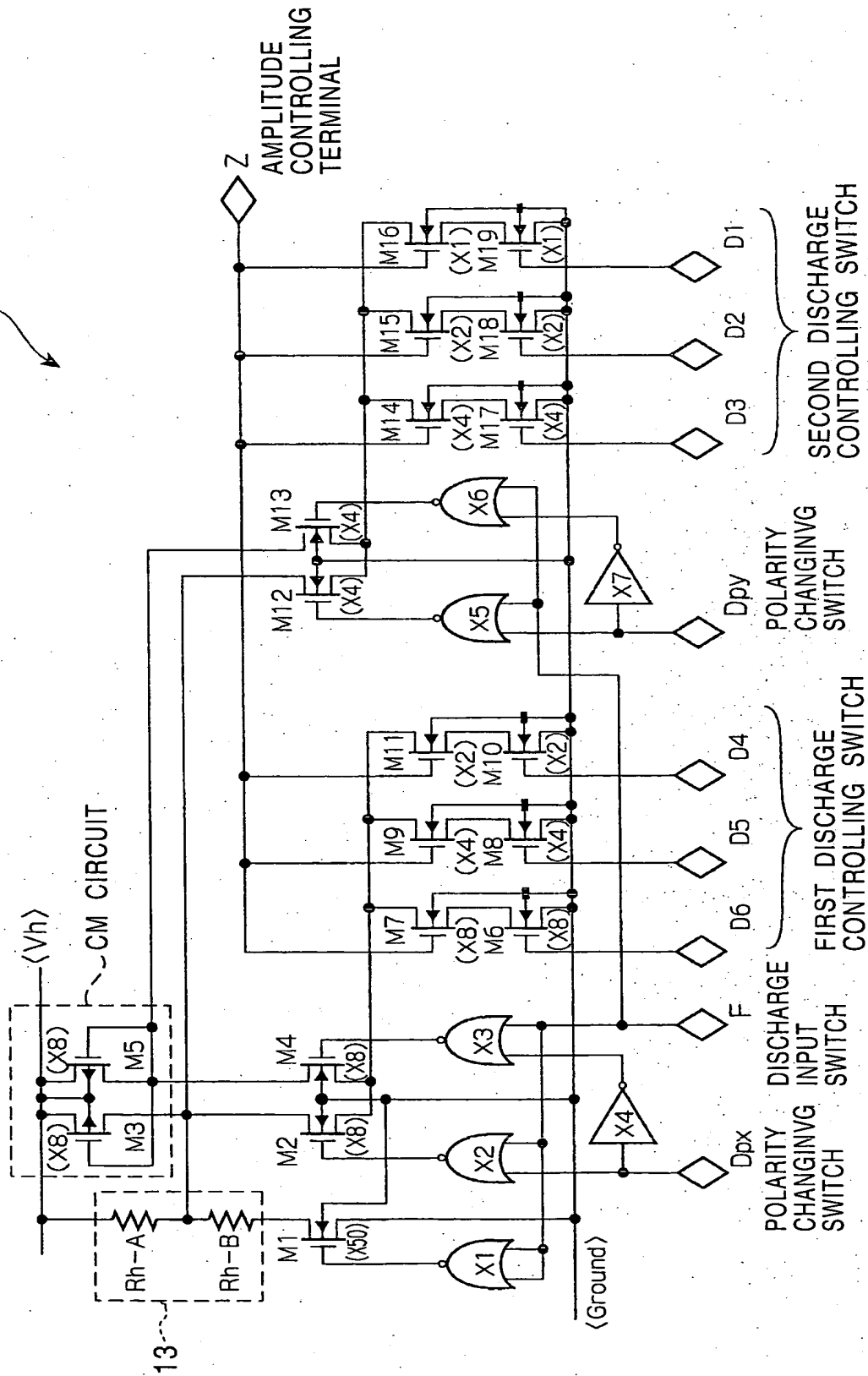
50
Z
AMPLITUDE CONTROLLING TERMINAL
〈Vh〉
CM CIRCUIT
Rh-A
Rh-B
13
(Ground)
M1
M2
M3
M4
M5
M6
M7
M8
M9
M10
M11
M12
M13
M14
M15
M16
M17
M18
M19
X1
X2
X3
X4
X5
X6
X7
(X50)
(X8)
(X4)
(X2)
(X1)
D1
D2
D3
D4
D5
D6
Dpx
Dpy
F
POLARITY CHANGINVG SWITCH
DISCHARGE INPUT SWITCH
FIRST DISCHARGE CONTROLLING SWITCH
SECOND DISCHARGE CONTROLLING SWITCH
POLARITY CHANGINVG SWITCH

FIG. 22A

STATE OF THE SWITCHES				LANDING POSITION OF DOTS							
Dpx	D6	D5	D4	−3	−2	−1	0	+1	+2	+3	
0	0	0	0				●				
		1				●					
	1	0			●						
		1		●							
1	0	0					●				
		1						●			
	1	0							●		
		1								●	

FIG. 22B

STATE OF THE SWITCHES				LANDING POSITION OF DOTS							
Dpx	D6	D5	D4	0	1	2	3	4	5	6	7
0	1	1	1	●							
		0			●						
	0	1				●					
		0					●				
1	0	0						●			
		1							●		
	1	0								●	
		1									●